

What is claimed is:

1. An optical disc including a data area and a time map area,
the data area recording a video object that includes a
plurality of data units, each of which contains at least one
5 picture; the first picture of each of the plurality of data
units being an Intra Picture that can be separately reproduced,

the time map area recording a table showing recording
addresses of data units, the addresses corresponding to a
plurality of reproduction times that belong to a period during
10 which the video object is reproduced, each of the data units
containing a picture to be reproduced at a corresponding one
of the plurality of reproduction times, and

the table recording data sizes of the Intra Pictures in
correspondence with the plurality of data units.

2. The optical disc of Claim 1 further including

a program chain area that records a plurality of sets
of cell information, each of which includes a start time and
an end time which are used to identify a reproduction section
20 in the video object, the plurality of sets of cell information
being recorded in correspondence with reproduction orders.

3. The optical disc of Claim 1, wherein

the table further records difference times, each of which
25 corresponds to one of the plurality of reproduction times and
is a difference between the one of the plurality of reproduction
times and a reproduction time of the first picture of a data
unit that includes a picture to be reproduced at the one of
the plurality of reproduction times.

4. A recording apparatus for recording video data onto an

optical disc, comprising:

an input unit operable to receive input video data to be recorded;

5 a compressing unit operable to compress the input video data and generate a video object containing a plurality of data units, each of which contains at least one picture, the first picture of each of the plurality of data units being an Intra Picture that can be separately reproduced;

10 a writing unit operable to write data onto the optical disc; and

a control unit operable to control the writing unit, wherein

the control unit

- 15 (a) controls the writing unit to write the video object onto the data area of the optical disc,
- (b) generates a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times, and
- 20 (c) controls the writing unit to write the table into a time map area of the optical disc.

25 5. The reproducing apparatus of Claim 4, wherein the optical disc further includes

a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section

30 in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

6. The reproducing apparatus of Claim 4, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

7. A recording method for use in a recording apparatus for recording onto an optical disc a video object containing a plurality of data units, each of which contains at least one picture, the first picture of each of the plurality of data units being an Intra Picture that can be separately reproduced, the recording method comprising the steps of:

writing the video object onto a data area of the optical disc;

generating a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times; and

writing the table onto a time map area of the optical disc.

8. The recording method of Claim 7, wherein the optical disc further includes

a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information

being recorded in correspondence with reproduction orders.

9. The recording method of Claim 7, wherein

the table further records difference times, each of which
5 corresponds to one of the plurality of reproduction times and
is a difference between the one of the plurality of reproduction
times and a reproduction time of the first picture of a data
unit that includes a picture to be reproduced at the one of
the plurality of reproduction times.

10. A reproducing apparatus for reproducing the video object
recorded on the optical disc defined in Claim 1, the reproducing
apparatus comprising:

a reading unit operable to read data from the optical
15 disc;

a reproducing unit operable to reproduce the video
object; and

a control unit operable to control the reading unit and
the reproducing unit, wherein

20 the control unit

(a) receives an instruction to reproduce at high speed,

(b) determines a plurality of reproduction times with a
predetermined time interval in between, in accordance
with the received instruction,

25 (c) controls the reading unit to read the table,

(d) refers to the read table and identifies, for each of the
plurality of reproduction times, (a) a recording address
and (b) a data size of an Intra Picture, and

30 (e) controls the reading unit and the reproducing unit to read
and reproduce Intra Pictures corresponding to the
plurality of reproduction times.

11. The reproducing apparatus of Claim 10, wherein the optical disc further includes

5 a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

10 12. The reproducing apparatus of Claim 10, wherein

15 the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

20 13. A reproduction method for use in a reproducing apparatus including (a) a reading unit operable to read data from the optical disc defined in Claim 1 and (b) a reproducing unit operable to reproduce a video object, the reproduction method comprising the steps of

- 25 (a) receiving an instruction to reproduce at high speed,
(b) determining a plurality of reproduction times with a predetermined time interval in between, in accordance with the received instruction,
(c) controlling the reading unit to read the table,
(d) referring to the read table and identifying, for each of the plurality of reproduction times, (a) a recording address and (b) a data size of an Intra Picture, and
30 (e) controlling the reading unit and the reproducing unit to

read and reproduce Intra Pictures corresponding to the plurality of reproduction times.

14. The reproduction method of Claim 13, wherein the optical
5 disc further includes

10 a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

15 15. The reproduction method of Claim 13, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

20 16. A computer-readable recording medium recording a program for use in a recording apparatus for recording onto an optical disc a video object containing a plurality of data units, each of which contains at least one picture, the first picture of each of the plurality of data units being an Intra Picture that
25 can be separately reproduced, the program allowing a computer to execute the steps of:

writing the video object onto a data area of the optical disc;

30 generating a table showing recording addresses of data units, the addresses corresponding to a plurality of reproduction times that belong to a period during which the

video object is reproduced, each of the data units containing a picture to be reproduced at a corresponding one of the plurality of reproduction times; and

writing the table onto a time map area of the optical disc.

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17. The computer-readable recording medium of Claim 16, wherein the optical disc further includes

a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

18. The computer-readable recording medium of Claim 16, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.

19. A computer-readable recording medium for use in a reproducing apparatus including (a) a reading unit operable to read data from the optical disc defined in Claim 1 and (b) a reproducing unit operable to reproduce a video object, the program allowing a computer to execute the steps of

- (a) receiving an instruction to reproduce at high speed,
- (b) determining a plurality of reproduction times with a predetermined time interval in between, in accordance with the received instruction,

- 5 (c) controlling the reading unit to read the table, (d) referring to the read table and identifying, for each of the plurality of reproduction times, (a) a recording address and (b) a data size of an Intra Picture, and (e) controlling the reading unit and the reproducing unit to read and reproduce Intra Pictures corresponding to the plurality of reproduction times.

10 20. The computer-readable recording medium of Claim 19, wherein the optical disc further includes

15 a program chain area that records a plurality of sets of cell information, each of which includes a start time and an end time which are used to identify a reproduction section in the video object, the plurality of sets of cell information being recorded in correspondence with reproduction orders.

20 21. The computer-readable recording medium of Claim 19, wherein

the table further records difference times, each of which corresponds to one of the plurality of reproduction times and is a difference between the one of the plurality of reproduction times and a reproduction time of the first picture of a data unit that includes a picture to be reproduced at the one of the plurality of reproduction times.